REMARKS

Claims 1 through 34 remain in this application. Claims 1 through 11, 20, 21 and 31 have been amended. Attached is a marked-up version of the changes made to the claims by the current amendment.

The Office Action rejected claims 1 through 8, 10 through 17, 19, 20 through 28, and 30-34 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,589,797 to Gans et al. (the Gans reference). However, the Gans reference fails to disclose or suggest key elements of the claims.

The present invention of claim 1 requires a power amplifier having an input signal path and an output signal path and a predistortion linearizer circuit that is capable of generating a distorted signal which is reflected onto the input signal path of the power amplifier, wherein said predistortion linearizer is located a predetermined distance from the input signal path and not physically coupled to the input signal path. As shown in Figures 4 and 5 of the present application, the predistortion linearizer 402 is located a predetermined distance "d" from the input signal path 416 and is not in physical contact with the input signal path 416. As explained in the specification at page 16, lines 20 through 25:

> "It should be noted that the predistortion linearizer 402 does not physically contact the signal path 416 or the power amplifier 406. As such, the predistortion linearizer 402 does not affect the signal path 416 nor does the predistortion linearizer 402 affect the operation of the power amplifier 406."

Thus, the predistortion linearizer of the present invention is able to reflect a distorted input signal onto the input signal path of the power amplifier without being in physical contact with the input signal path. This feature provides significant advantages to the invention.

The Gans reference fails to disclose the requirements of claim 1, *inter alia*, of a predistortion linearizer circuit that is capable of generating a distorted signal which is reflected onto the input signal path of the power amplifier, wherein said predistortion linearizer is located a predetermined distance from the input signal path and not physically coupled to the input signal path. Instead, the Gans reference shows in Figure 1 a cuber 15, LNA 16 and variable phase shifter 17 that generate a distorted signal and are physically coupled to the input signal

path by a summer 18. The Gans reference explains at column 3, lines 44 through 46 that, "Variable phase shifter 17 is utilized to phase shift the output of LNA 16 to provide signal S2 that is applied to one input port of summer 18. The output of delay line 13 is applied to the other input port of summer 18." Thus, the Gans reference fails to disclose the requirement of claim 1 of a predistortion linearizer capable of generating a distorted signal which is reflected onto the input signal path of the power amplifier and inputted into said power amplifier, wherein said predistortion linearizer is located a predetermined distance from the input signal path and not physically coupled to the input signal path.

Similarly for independent claims 10, 20 and 31, the Gans reference reference fails to disclose or suggest the requirements of the claims that a predistortion linearizer reflects a distorted signal onto a input signal path without being phyically connected to the input signal path for the above reasons.

In addition, the Office Action rejected claim 33 over U.S. Patent 6,369,603 to Johnston et al. (the Johnston reference). The Johnston reference fails to disclose or suggest the requirements of the present invention because it is not even in a related field. The Johnston reference discloses an apparatus for measuring the minority carrier lifetime of a semiconductor sample using radio frequency coupling. The Office Action states that the Johnston reference shows that a "predetermined distance between two coupling elements (244,232) can be tuned to compensate for the nonlinear spurs using metal variable capacitors (Col. 20 lines 50-60)." These two elements in the Johnston reference are a semiconductor sample that is stimulated by a laser 232 to generate radio waves and an antenna 244 to receive the radio waves radiated from the sample. These are not an input signal path to a power amplifier and a predistortion linearizer. Furthermore, there is no suggestion to combine the Johnston reference with the Gans reference since the two references are in a completely different field. Even if combined, the two references would fail to meet the requirements of the claims since the antenna and semiconductor sample as shown in the Johnston reference cannot be used with a predistortion linearizer to reflect a distorted signal onto the input signal path of a power amplifier.

For the above reasons, the Gans reference and the Johnston reference fail to teach or suggest the requirements of the present claims.

Conclusion

This amendment places the application in condition for allowance. Therefore, it is respectfully requested that the rejection of the claims be withdrawn and full allowance granted. Should the Examiner have any further comments or suggestions, please contact Jessica Smith at (972) 477-9109.

Respectfully submitted,

ALCATEL

Jessica Smith

Jessica W. Smith
Reg. No. 39,884

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Alcatel USA
Intellectual Property Department
1000 Coit Road, M/S LEGL2
Plano, TX 75075
Phone: (972) 477-9109
Fax: (972) 477-9328

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1 (Amended). A circuit for amplifying a signal [transmitter], comprising:

a power amplifier having an input signal path and an output signal path; and

a predistortion linearizer circuit that is [including a diode] capable of generating a distorted signal which is reflected onto [a] the input signal path of the power amplifier and inputted into said power amplifier, wherein said predistortion linearizer is located a predetermined distance from the input signal path and not physically coupled to the input signal path, and said distorted signal compensates for at least some of the nonlinear spurs introduced by said power amplifier to an input signal applied to the input signal path and inputted into said power amplifier such that said power amplifier generates a compensated output signal.

2 (Amended). The circuit [transmitter] of Claim 1, wherein said predistortion linearizer includes:

a [said] diode;

a coupling circuit, coupled to said diode, capable of introducing a relatively small amount of power from the input signal into said diode and further capable of reflecting the distorted signal generated by said diode back onto the input signal path [and into said power amplifier] without being physically coupled to the input signal path; and

a direct current adjustment circuit, coupled to said diode, capable of adjusting the amount of direct current inputted into said diode.

3 (Amended). The circuit [transmitter] of Claim 2, wherein said coupling circuit includes a microstrip having a predefined shape and located a predetermined distance from the signal path leading into said power amplifier.

4 (Amended). The circuit [transmitter] of Claim 2, wherein said diode is a Schottky diode.

5 (Amended). The circuit [transmitter] of Claim 2, wherein said coupling circuit and said direct current adjustment circuit are manually adjusted to optimize a shape of the distorted signal.

6 (Amended). The circuit [transmitter] of Claim 2, wherein said coupling circuit and said direct current adjustment circuit are automatically adjusted to optimize a shape of the distorted signal.

7 (Amended). The circuit [transmitter] of Claim 1, wherein said predistortion linearizer does not affect the signal path or the operation of said power amplifier.

8 (Amended). The circuit [transmitter] of Claim 1, wherein said ciruit is in a transmitter [is] incorporated within a point-to-point communication system.

9 (Amended). The circuit [transmitter] of Claim 1, wherein said circuit is in a transmitter [is] implemented in a wireless system operating at or above 2 GHz.

10 (Amended). A predistortion linearizer for use with a nonlinear device, said predistortion linearizer comprising a diode capable of generating a distorted signal which is reflected onto a signal path and inputted into the nonlinear device, wherein said predistortion linearizer is not physically coupled to [located a predetermined distance from] the signal path and said distorted signal compensates for at least some of the nonlinear spurs introduced by the nonlinear device to an input signal applied to the signal path and inputted into said nonlinear device such that said nonlinear device outputs a compensated output signal.

11 (Amended). The predistortion linearizer of Claim 10, wherein said predistortion linearizer includes:

said diode;

a coupling circuit, coupled to said diode, capable of introducing a relatively small amount of power from the input signal into said diode and further capable of reflecting the distorted

signal generated by said diode back onto the signal path and into said nonlinear device without being physically coupled to the signal path; and

a direct current adjustment circuit, coupled to said diode, capable of adjusting the amount of direct current inputted into said diode.

12. The predistortion linearizer of Claim 11, wherein said coupling circuit includes a microstrip having a predefined shape and located a predetermined distance from the signal path leading into said nonlinear device.

13. The predistortion linearizer of Claim 11, wherein said coupling circuit and said direct current adjustment circuit are manually adjusted to optimize a shape of the distorted signal.

14. The predistortion linearizer of Claim 11, wherein said coupling circuit and said direct current adjustment circuit are automatically adjusted to optimize a shape of the distorted signal.

15. The predistortion linearizer of Claim 10, wherein said diode is a Schottky diode.

16. The predistortion linearizer of Claim 10, wherein the type of diode used depends on the frequency of the input signal.

17. The predistortion linearizer of Claim 10, wherein said predistortion linearizer does not affect the signal path or the operation of said nonlinear device.

18. The predistortion linearizer of Claim 10, wherein said predistortion linearizer is incorporated within a transmitter operating at or above 2 GHz.

19. The predistortion linearizer of Claim 10, wherein said nonlinear device is a power amplifier or a mixer.

20 (Amended). A method for linearizing a nonlinear device, said method comprising the steps of:

receiving, at the nonlinear device, an input signal on a signal path;

generating [, using a diode,] a distorted signal which is reflected onto the signal path by a coupling circuit and inputted into the nonlinear device, wherein the coupling circuit is not physically connected to the signal path; and

outputting, from the nonlinear device, a compensated signal, wherein said distorted signal compensates for at least some of the nonlinear spurs introduced to the input signal by the nonlinear device.

21 (Amended). The method of Claim 20, wherein said step of generating a distorted signal includes:

introducing, using a coupling circuit, a relatively small amount of power into the diode from the input signal;

generating, using a [the] diode, the distorted signal; and

reflecting, using the coupling circuit, the distorted signal back onto the signal path and into the nonlinear device, wherein said coupling circuit is located a predetermined distance from the nonlinear device.

22. The method of Claim 21, wherein said diode can generate the distorted signal that includes predetermined nonlinear spurs having phases and amplitudes which are in part a function of the amount of direct current inputted into said diode by a direct current adjustment circuit.

23. The method of Claim 22, wherein said coupling circuit includes a microstrip having a predefined shape and located a predetermined distance from the signal path leading into said nonlinear device.

24. The method of Claim 22, wherein said coupling circuit and said direct current adjustment circuit were manually adjusted to optimize a shape of the distorted signal.

25. The method of Claim 22, wherein said coupling circuit and said direct current adjustment circuit were automatically adjusted to optimize a shape of the distorted signal.

26. The method of Claim 20, wherein said diode is a Schottky diode.

27. The method of Claim 20, wherein the type of diode used depends on the frequency of the input signal.

28. The method of Claim 20, wherein said diode does not affect the signal path or the operation of the nonlinear device.

29. The method of Claim 20, wherein said nonlinear device and said diode are incorporated within a transmitter operating at or above 2 GHz.

30. The method of Claim 20, wherein said nonlinear device is a power amplifier or a mixer.

31 (Amended). A predistortion linearizer for use with a nonlinear device, said predistortion linearizer comprising:

a coupling circuit capable of receiving a relatively small amount of power from an input signal on a signal path that is connected to the nonlinear device [located a predetermined distance from said coupling circuit], wherein said coupling circuit is not physically connected to the signal path [and connected to the nonlinear device];

a diode, coupled to said coupling circuit, capable of receiving the relatively small amount of power from the input signal;

a direct current adjustment circuit, coupled to said diode, capable of adjusting the amount of direct current inputted into said diode which is capable of generating a distorted signal; and

said coupling circuit further capable of reflecting the distorted signal generated by said diode back onto the signal path and into said nonlinear device, wherein said distorted signal compensates for at least some of the nonlinear spurs introduced by the nonlinear device to the

input signal applied to the signal path and inputted into said nonlinear device such that said nonlinear device outputs a compensated output signal.

32. The predistortion linearizer of Claim 31, wherein said coupling circuit includes a microstrip having a predefined shape and located the predetermined distance from the signal path connected to said nonlinear device.

33. The predistortion linearizer of Claim 31, wherein the predetermined distance the coupling circuit is located from the nonlinear device can be tuned to compensate for the nonlinear spurs using metalized ceramic tabs or variable capacitors.

34. The predistortion linearizer of Claim 31, wherein said predistortion linearizer is placed in front of the nonlinear device.